What is claimed is:

1. A photonic network packet routing method comprising:

a step of optically encoding destination address information attached to an IP packet using light attributes,

a step of discriminating the encoded address information of the IP packet by optical correlation processing,

a step of switching to an output path for the IP packet based on a result of the discrimination, and

a step of outputting the IP packet labeled with prescribed address information on the output path selected by the switching step.

2. A packet routing method according to claim 1, wherein the optical encoding of the destination address information attached to the IP packet is conducted by dividing an optical pulse output by a pulse source into N number of chip pulses ($N \geqq 2$) having a prescribed delay time therebetween, imparting the individual chip pulses with phase shifts of "0" or "π" relative to a light carrier phase of the chip pulses, and recombining the divided optical chip pulses.

3. A packet routing method according to claim 1, wherein the optical encoding of the destination address information attached to the IP packet is conducted by dividing an optical pulse output by a pulse source into N number of chip pulses ($N \geqq 2$) having a prescribed delay time therebetween, changing normalized intensity of the individual chip pulses to "1" or "0", and recombining the divided optical chip pulses.

4. A packet routing method according to claim 1, wherein discrimination of the optically encoded address information is conducted by sending the IP packet labeled with address information onto a number of arms equal to the number of address entries and simultaneously conducting optical correlation processing on all arms in parallel.

5. A packet routing method according to claim 1, wherein discrimination of the encoded address information by optical correlation processing is conducted by subjecting optical chip pulses to matched filtering, effecting threshold processing on a center peak value of a generated autocorrelation function, and optically regenerating the obtained "0" or "1".

6. A packet routing method according to claim 1, further comprising a step of subjecting an output of an optical decoder to time gate processing, when subjecting a center peak value of a correlation function to threshold processing, thereby cutting off a center part and eliminating side-lopes of correlation waveform and a step of conducting threshold processing.

7. A packet routing method according to claim 1, further comprising a step of

dividing an IP packet having encoded address information in two, a step of conducting optical correlation processing to discriminate address information from an optical code in one IP packet containing address information between the two divided IP packets, a step of selecting an output path based on a result of the discrimination, and a step of outputting the other divided IP packet on the selected output path.

8. A packet routing method according to claim 6, wherein the address information is discriminated by sending the one IP packet onto a number of arms equal to the number of output paths and simultaneously conducting optical correlation processing on all arms in parallel.

9. A packet routing method according to claim 7, wherein an optical code in the one packet is discriminated by optical correlation processing, the discriminated signal is converted to an electric signal, and a gate of a prescribed output path is opened by the electric signal.

10. A packet routing method according to claim 7, wherein an optical code in the one packet is discriminated by optical correlation processing and an optical switch of a prescribed output path is turned ON by the discriminated optical signal.

11. A packet routing method according to claim 1, further comprising a step of combining the IP packet output on the prescribed path and a pulse signal for control adjusted to generate an optical pulse at a portion where it is desired to convert the optical code and a step of converting the combined signal into a prescribed optical code by cross-phase conversion.

12. A packet router for a photonic network comprising:

means for encoding by use of light attributes destination address information attached to an IP packet,

branching means for sending the IP packet having the encoded destination address information onto two paths,

address processing means for subjecting one IP packet received from the branching means to optical correlation processing and outputting a switch control signal based on a result of the discrimination, and

switch means for selectively outputting the packet by switching an output path of the other packet received from the branching means based on the address control signal from the address processing means.

13. A packet router according to claim 11, wherein the encoding means comprises multiple tunable taps for dividing a light pulse output by a pulse source into a prescribed number of optical chip pulses, optical phase shifters for imparting phase shifts of "0" or "π" to each divided chip pulse, and a combiner for recombining the divided

optical chip pulses.

14. A packet router according to claim 11, wherein the encoding means comprises multiple tunable taps for dividing a light pulse output by a pulse source into a prescribed number of optical chip pulses, gate switches for changing optical intensity of the chip pulses to "1" or "0", and a combiner for recombining the divided optical chip pulses.

15. A packet router according to claim 11, wherein the address processing means comprises means for sending the one IP packet sent onto one path by the branching means onto a number of arms equal to the number of addresses, and a decoder provided on the individual arms for outputting a switch control signal when the decoder's own code and the code of IP packet coincide.

16. A packet router according to claim 14, wherein the switch means comprises means for sending the other IP packet sent onto the other path by the branching means onto a number of arms equal to the number of output ports and an optical gate provided on each arm that opens in response to a switching control signal from the decoder to output the IP packet onto the arm.

17. A packet router according to claim 11, further comprising a combiner for combining an IP packet output through a prescribed path with a pulse signal for control adjusted to generate an optical pulse at a portion where it is desired to convert the optical code and a nonlinear optical medium for converting the combined signal into a prescribed optical code by cross-phase conversion.